IN THE CLAIMS

1. (currently amended) A breathing assistance device, comprising:

a turbine to generate a flow of pressurised respiratory gas, said turbine having an inertia less than about 200 $g.cm^2$,

a duct adapted to carry the pressurised gas to a patient, and

control means for controlling gas pressure capable of computing a pressure setting for the turbine,

wherein the turbine is connected to a speed sensor capable of acquiring a signal corresponding to a rotation speed of a rotating element of the turbine, and the control means includes means of calculation connected to said speed sensor to compute the pressure setting using only said speed signal and send the pressure setting to the turbine, said means of calculation being adapted to detect new inspiratory or expiratory cycles using only said speed signal, and consequently adapting a level of said pressure setting.

2. (previously presented) A device as claimed in claim 1, wherein said speed sensor implements a Hall effect sensor.

3. (previously presented) A device as claimed in claim 1, wherein said speed sensor is a sensor capable of acquiring a turbine speed signal directly connected to the rotation speed of the rotating element of the turbine.

4. (previously presented) A device as claimed in claim 1, wherein the means of calculation computes the pressure setting according to variations in speed.

5. (canceled)

6. (previously presented) A device as claimed in claim 1, further comprising a program for detecting an inspiratory cycle using a comparison between:

a speed value stored in a memory of the device, said speed value being extrapolated using recent values of measured speeds, andan actually measured instantaneous speed.

7. (previously presented) A device as claimed in claim 1, further comprising a program for detecting an inspiratory cycle using a comparison between:

a speed value stored in a memory of the device, said speed value being representative of a recent speed bearing, and

an actually measured instantaneous speed.

8. (previously presented) A device as claimed in claim 6, further comprising a program for detecting an inspiratory cycle using a comparison between:

a speed value stored in a memory of the device, said speed value being representative of a speed at an end of an expiratory cycle, and

an actually measured instantaneous speed.

9. (previously presented) A device as claimed in claim 6, further comprising several programs for detecting an inspiratory cycle operating simultaneously, and is capable of computing a pressure setting corresponding to a start of inspiratory cycle as soon as one of said programs for detecting the inspiratory cycle has signalled a start of inspiration.

10. (previously presented) A device as claimed in claim 6, wherein the program for detecting the inspiratory cycle is configured to be disabled for a determined duration following a start of a new expiratory cycle.

11. (previously presented) A device as claimed in claim 1, further comprising a program for detecting an expiratory cycle.

12. (previously presented) A device as claimed in claim 11, wherein said program for detecting the expiratory cycle uses a comparison between:

a maximum turbine speed stored in a memory of the device and corresponding to an inspiratory cycle, and

an actually measured instantaneous speed.

13. (previously presented) A device as claimed in claim 1, wherein said means of calculation includes a microprocessor connected to the speed sensor and to a turbine pressure setting input.

14. (previously presented) A device as claimed in claim 1, wherein the device further includes a pressure-regulating loop comprising:

a pressure sensor on the duct, and

a circuit receiving the pressure setting coming from the means of calculation as well as a pressure measured by the pressure sensor, said circuit being capable of computing an instantaneous rotation speed setting for the turbine, said circuit being connected to a turbine speed setting input.

15. (currently amended) A method for regulating a pressure of a respiratory gas delivered by a turbine to a patient, the method comprising:

providing a signal representative of a rotation speed of a rotating element of the turbine<u>, said turbine having an inertia less than about 200 g.cm^2</u>; and

computing a pressure setting for the turbine based only on the signal representative of the rotation speed,

said method being adapted to detect new inspiratory or expiratory cycles using only said signal, and of consequently adapting a level of the pressure setting.

16. (previously presented) A method as claimed in claim 15, wherein said signal corresponds to the rotation speed of the turbine rotor.

17. (canceled)

18. (previously presented) A method as claimed in claim 15, wherein the method implements a program for detecting an inspiratory cycle using a comparison between:

a speed value stored in a memory, said speed value being extrapolated from recent values of measured speeds, and

an actually measured instantaneous speed.

19. (previously presented) A method as claimed in claim 15, wherein the method implements a program for detecting an inspiratory cycle using a comparison between:

a speed value stored in a memory, said speed value being representative of a recent speed bearing, and

an actually measured instantaneous speed.

20. (previously presented) A method as claimed in claim 15, wherein the method implements a program for detecting inspiratory cycles using a comparison between:

a speed value stored in a memory, said speed value being representative of a speed at the end of an expiratory cycle, and

an actually measured instantaneous speed.

21. (previously presented) A method as claimed in claim 18, wherein the method implements several programs for detecting inspiratory cycles operating simultaneously, and

computes the pressure setting corresponding to an inspiratory flow as soon as one of said programs for detecting the inspiratory cycles has signalled the start of inspiration.

22. (previously presented) A method as claimed in claim 18, wherein the program for detecting inspiratory cycles is disabled during a determined duration following the start of a new expiratory cycle.

23. (previously presented) A method as claimed in claim 15, wherein the method implements a program for detecting expiratory cycles.

24. (previously presented) A method as claimed in claim 23, wherein said program for detecting expiratory cycle uses a comparison between:

a maximum turbine speed stored in a memory and corresponding to an inspiratory cycle, and

an actually measured instantaneous speed.